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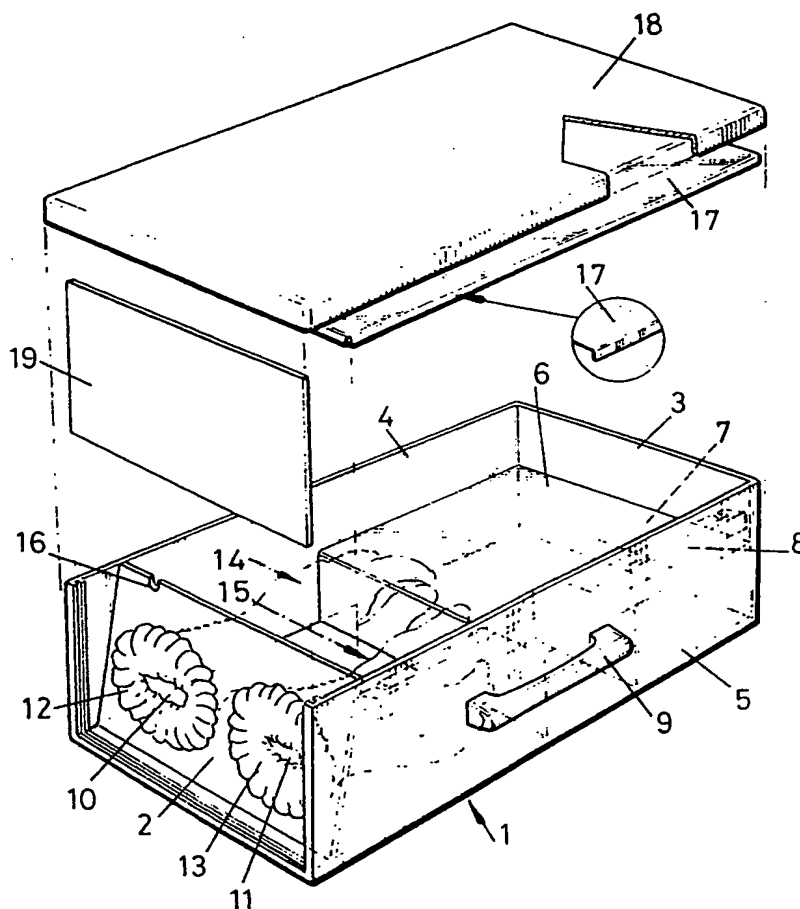
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## (54) Personal sterilizing unit

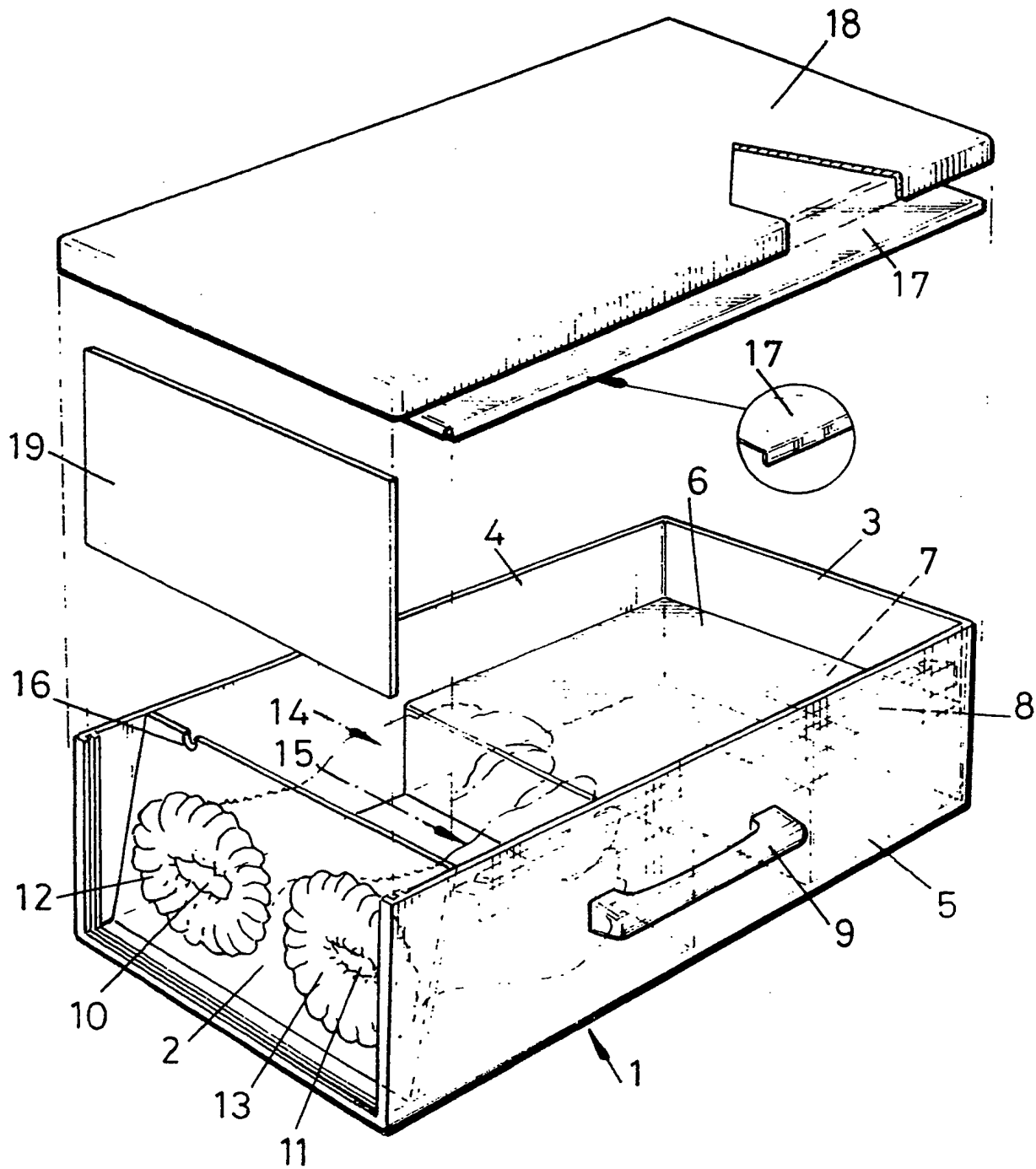
(57) A personal sterilizing unit, for use in continuous ambulatory peritoneal dialysis to enable a patient to effect a bag change in sterile conditions, comprises a housing 1 adapted to receive all bag changing materials including a fresh bag of dialysis fluid and an old bag still connected (through groove 16) to the patient and filled with waste-laden dialysis. Also provided are a closeable access opening 18 for placing said materials in the housing 1 and removing them therefrom, a source 8 of ultraviolet light mounted in said housing 1 for irradiating the housing contents, a transparent housing wall portion 17 for viewing the housing contents, and a pair of openings 10, 11 in a housing wall 2 hermetically connected to cuffs 12, 13 of respective gloves 14, 15 into which the patient can place his hands so as to effect a bag change within the sterile confines of the housing.



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## SPECIFICATION

### A personal sterilizing unit

5 This invention relates to a personal sterilizing unit for use in continuous ambulatory peritoneal dialysis (CAPD) to enable a patient to effect a bag change in sterile conditions.

CAPD is a common form of dialysis treatment for 10 patients suffering from kidney malfunction. A permanent connection is made to the patient's peritoneal cavity by way of a tube of which the distal end can be connected to a bag containing some 2 litres of dialysis fluid. The dialysis fluid is infused into the 15 peritoneal cavity, the access tube is clamped off and the flexible, plastic bag, which is now empty, is usually rolled or folded and carried by the patient under his clothes during the dialysis treatment. During the treatment, waste materials pass from the 20 bloodstream into the dialysis fluid by diffusion across the peritoneal membrane. After an appropriate dwell period, which may be several hours, the patient unwraps the bag, lowers it to the floor, releases the clamp and allows the waste-laden 25 dialysis fluid to drain from the peritoneal cavity into the bag. The old bag is then replaced with a fresh bag and the process is repeated. Typically, four bag replacements are required every 24 hours.

Bag replacement must be carried out under sterile 30 conditions. Set sterile procedures have been established for changing a bag but nevertheless serious infections frequently occur. In particular, most CAPD patients require periodic hospitalisation for treatment of peritonitis caused by contamination during 35 bag changing.

It is an object of the present invention to avoid or reduce the risk of peritoneal infections in CAPD treatment.

According to the present invention there is provided a personal sterilizing unit for use in continuous 40 ambulatory peritoneal dialysis to enable a patient to effect a bag change in sterile conditions, comprising a housing adapted to receive all bag changing materials including a fresh bag of dialysis fluid and 45 an old bag still connected to the patient and filled with waste-laden fluid, a closeable access opening for placing said materials in the housing and removing them therefrom, a source of ultraviolet light mounted in said housing for irradiating the housing 50 contents, a transparent housing wall portion for viewing the housing contents, and a pair of openings in a housing wall hermetically connected to cuffs of respective gloves into which the patient can place his hands so as to effect a bag change within the 55 sterile confines of the housing.

The invention will now be further described by way of example only, with reference to the accompanying drawing which is an exploded perspective view of one embodiment of a personal sterilizing 60 unit in accordance with the invention.

Referring now to the drawing, the personal sterilizing unit comprises a housing in the form of a rectangular, open-topped box 1 with end walls 2, 3 interconnected by long side walls 4, 5. A raised floor 65 portion 6 is provided adjacent the end wall 3 and

incorporates heating elements (not shown). The space under the raised floor 6 is occupied by the power supply indicated diagrammatically at 7 and preferably in the form of rechargeable batteries. A 70 source of UV light 8 extends along the inside of the side wall 5 near the top of the box. On the other side of the wall 5 is a carrying handle 9.

The end wall 2 has a pair of openings 10, 11 therein to which are connected the cuffs 12, 13 of 75 gloves 14, 15 into which the patient can place his hands to effect a bag change as will be described.

The end wall 2 has a groove 16 in its upper edge for a purpose to be described. The box 1 includes a lid 17 of synthetic plastics material of a type that is 80 both transparent and impermeable to UV light. In addition, the box has a top cover 18 and an end cover 19 for placement over the lid 17 and end wall 2 respectively when the unit is not in use.

The UV light source is powered by the rechargeable 85 batteries 7 although it will be appreciated that additionally or alternatively a mains power supply may be provided. Thermostatic control means for the heated floor 6 as well as other control circuitry are housed along with the batteries 7 under the 90 raised part of the floor and an interlock switch is provided between the lid 17 and the rest of the box in order to ensure that the UV light can only be used when the lid is properly in position.

In use, the covers 18, 19 are removed. The lid 17 is 95 lifted and a fresh bag of dialysis fluid is placed on the floor 6 together with the other items that will be required for bag changing, e.g. clamps for clamping off the old bag, medication to be introduced into the new bag, syringes for such medication, sterile swabs 100 for wiping surfaces, a connector shield for protecting the connection between the peritoneal tube and the new bag, etc. The lid 17 is then replaced and the UV light switched on while the patient drains the dialysis fluid back into the old bag. The lid 17 is then lifted 105 and the old bag filled with waste-laden dialysis fluid is placed into the housing with the peritoneal tube located in the groove 16. The lid 17 is then replaced, the UV light switched on and the patient places his hands into the gloves 14, 15 and carries out the 110 following sequence of operations:-

1. The old bag is clamped off;
2. The new connector shield packet is opened;
3. The protective tag is pulled off the new bag;
4. The old connector shield is removed from the 115 existing connection;
5. The peritoneal tube is disconnected from the old bag;
6. The connector end of the peritoneal tube and the new bag connector are held close to the UV light 120 for a short period of time and then connected to each other;
7. The new connector shield is applied.

It will be appreciated that minor changes may be made to this sequence of operations. For example, 125 an additional step may involve the introduction of medication into the new bag which will also entail wiping of certain surfaces with sterile swabs.

The UV light is now switched off, the lid 17 removed, and the bag changing materials taken out. 130 The new bag of fluid is now suspended on a stand to

allow the dialysis fluid to drain into the patient's peritoneal cavity, the seal on the new bag first being broken by flexing the new bag connection tube.

## 5 CLAIMS

1. A personal sterilizing unit for use in continuous ambulatory peritoneal dialysis to enable a patient to effect a bag change in sterile conditions,  
10 comprising a housing adapted to receive all bag changing materials including a fresh bag of dialysis fluid and an old bag still connected to the patient and filled with waste-laden dialysis, a closeable access opening for placing said materials in the housing  
15 and removing them therefrom, a source of ultra-violet light mounted in said housing for irradiating the housing contents, a transparent housing wall portion for viewing the housing contents, and a pair of openings in a housing wall hermetically con-  
20 nected to cuffs of respective gloves into which the patient can place his hands so as to effect a bag change within the sterile confines of the housing.
2. A unit as claimed in claim 1, wherein the housing is of rectangular box shape with an open  
25 top (the access opening) closeable by a lid of UV-impermeable transparent plastics material (the transparent housing wall portion).
3. A unit as claimed in claim 2, comprising electrical control means including an interlock for  
30 ensuring that the source of UV light can be switched on only when the lid is correctly in position.
4. A unit as claimed in any one of the preceding claims, wherein the housing has a floor on which the bag changing materials are intended to be received,  
35 said floor having a portion incorporating heating means for warming the contents of the fresh bag prior to infusion into the patient.
5. A unit as claimed in any one of the preceding claims, wherein the UV light source extends along a  
40 side of the housing above the floor thereof.
6. A unit as claimed in any one of the preceding claims, wherein a cover is provided for covering said pair of openings when the unit is not in use.
7. A unit as claimed in any one of the preceding  
45 claims, including a power supply in the form of one or more rechargeable batteries.
8. A personal sterilizing unit for use in continuous ambulatory peritoneal dialysis to enable a patient to effect a bag change in sterile conditions,  
50 substantially as herein described with reference to the accompanying drawing.